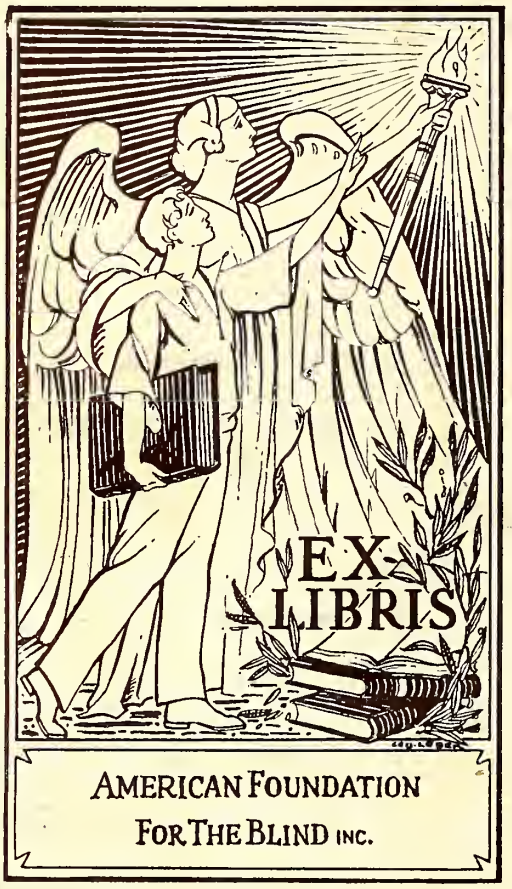
COFFIN

LARGE TYPE READING TESTS



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THE LARGE TYPE READING TESTS
Conducted in the Conservation of Vision Classes
in the Cleveland Public Schools
April 1919 - January 1920

The Conservation of Vision Classes in Cleveland were organized in 1913. At that time little reading material was available for pupils whose eye condition did not permit of the use of ordinary ink type of 10 to 12-point size. During this early period, therefore, all reading matter had to be copied with crayon pencils, a fact which li .ted the supply. As soon, however, as the problem could be taken up it was done, with the result that, after a considerable search for a way of increasing the number of large type books, such books were furnished to the classes in 1914.

These books were printed to order in 36-point Clearface, heavy type on buff paper. This is a type designed by the Type Founders Company in an effort to obtain the maximum of legibility without special regard to beauty of form. The size was thought to be that required by children with low degrees of vision, but was, nevertheless, criticized unfavorably by some pupils and teachers. After it had been used a short time, samples of other large types, selected upon the advice of certain printers, were submitted to the pupils in the Conservation of Vision Classes and they were asked to choose the size and style most legible. The results showed that 36-point type was too large for the majority, as the type ranking first in popularity according to this method was the 24-point Caslon Bold. The printing of books in this latter type, called the Clear Type Series, was commenced in Cleveland in 1917.

Because of the somewhat arbitrary manner in which this style of type was selected, no data was at hand sufficient to satisfy the questioning of friendly critics; and no proofs of the wisdom of the choice could be offered those who thought they might prefer another type. Although

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the 24-point Caslon Bold had become almost immediately "popular" with the majority of children, it was, nevertheless, deemed wise to listen to the minority criticisms of "too dark", "too small", "too big", etc., and to look forward to making a thorough test of the relative legibility of types. Since the books were being printed for classes in cities other than Cleveland, an accurate determination of a standard type was by no means a trivial consideration.

In the spring of 1919 the opportunity was offered for making a series of tests to determine in a more systematic manner the kind of type which was most legible for the majority of the pupils enrolled in Conservation of Vision Classes. Five tests have been conducted in all, covering a period of about eight school months. All of them were given to the pupils above the 3rd grade in the Cleveland Conservation of Vision Classes, and the last set of tests was also given to the pupils in those classes in Boston, New Bedford, New York, Mansfield, O., Ashtabula, O., and Toledo, O.

The details of the first tests will not be described as the first two proved to more an experiment to determine how the desired results should be obtained than a true test of type legibility. There were sixteen different types represented in these two tests. Two were eliminated at once because of the fine hair lines and the trying shape of the letters, another was dropped out because it was too small. Others were known to be "unpopular" with the pupils, but it was felt only fair to give them further trials. The third test comprised a set of sheets in fourteen different styles of type (the 24-point Caslon Bold was added for this test) each sheet of which contained the same identical 44 words arranged in 14 different orders. All but five of the styles were eliminated after this test. Those which ranked highest are as follows:

30-point Caslon Oldstyle
30-point Cloister Oldstyle
30-point Clearface
24-point News Gothic
24-point Century School Book
24-point Caslon Bold

It is interesting to note that although the methods of conducting the earlier tests were considered far from satisfactory, the results tallied in many respects with those of this third test.

With the exception of the News Gothic all the types listed above have certain characteristics in common; they have no fine lines which give the appearance of shading to a page; they are all types in popular use in the smaller sizes; they present a fairly bold and dark appearance in the larger sizes. Those in which the spaces between the letters are the widest, such as in the Caslon Oldstyle, ranked highest in the tabulations. Although the Caslon Oldstyle is a 30-point type, the letters are very little larger than the lettersof other types in 24-point sizes. There is, however, more space between the letters in the Caslon Oldstyle.

From the analysis of these types the following deductions were made concerning the characteristics of the type most easily read by the pupils:

1. The serif should not be too short
2. There should be no fine hair lines
3. There should not be much deviation from the usual shape of the letters.
4. There should be considerable space between the body strokes.

As a result of these experiments the types which were found to rank first, with the exception of the News Gothic, were again used in a fourth test given to the same children who had been given the previous ones. The News Gothic was omitted because of its extreme deviation in design from all other types which had ranked high, and also because it

seemed quite definitely to "hurt" the reader's eyes even when it was read in good time and with few errors.

Although the spaces between the lines were made uniform for all the types, the same styles were printed with two different letter spacings, i. e. as in the third test, and with a wider letter spacing. The results of this test confirmed the suspicions as to letter and line spacing. The spacing had apparently been a large factor in the choice of type. When sufficiently spaced, the styles all ranked so near to each other that it did not seem fair to drop any one of them. No one of them had as yet been shown to have a marked advantage over the others in point of legibility.

A fifth and final test was given with sheets having the same 44 simple words as before and pr nted in the following styles:

30-point Caslon Oldstyle leaded 4 points no letter spacing
24-point Caslon Bold leaded 6 points 2 pt. letter spacing
24-point Caslon Light " 6 " 2 " " "
24-point Clearface leaded 10 points 2 pt. letter spacing
30-point Clearface 31 picas leaded 6 points - no letter spacing
30-point Cloister Oldstyle leaded 4 points 2 pt. letter spacing
24-point Century School Book leaded 10 points 2 pts. letter spacing

The words were chosen with special reference to letters such as o, e, a, m, n, b, d, which might readily be mistaken by a child with poor sight if the type was illegible to him; or to such combinations as lo, li, bi, fi, which must be seen clearly to be read correctly. It was intended to give the test only to pupils in grades above the third, but it seemed advisable to test a few pupils from the third grade in order to have additional cases of the less common eye conditions. There were enough copies of the tests printed so that the observer might follow a fresh set for each child and mark the errors on each sheet. When the child finished reading, the time, distance, effort, and remarks were recorded on that sheet, thus making it that child's complete record in that type.

No. 1 18-pt. Century School Book, 31 picas, leaded 8 pts.

¶ cut must sister come friend. take

No. 2 24-pt. Century School Book, 31 picas, leaded 6 pts.

¶ out back dear threw find our

No. 3 18-pt. Clearface, 31 picas, leaded 8 pts.

ball bill door felt lost than men ships at

No. 4 24-pt. Clearface, 31 picas, leaded 6 pts.

find threw dear back cut clam

No. 5. 30-pt. Clearface, 31 picas, leaded 6 pts.

glass bay balls far threw love

No. 6. 24-pt. Bodoni Book, 31 picas, leaded 4 pts.

¶ Before it was light, the little girl was

No. 7. 30-pt. Bodoni Book, 31 picas, leaded 2 pts.

¶ The winds keep the air sweet,
and bring good health but once

No. 8. 24-pt. Cloister Oldstyle, 31 picas, leaded 4 pts,

cloth door busy eat such those dears

No. 9. 30-pt. Cloister Oldstyle, 31 picas, leaded 2 pts.

Rain comes and the flowers and

No. 10 18-pt. News Gothic, 31 picas, leaded 6 pts.

Snow is frozen rain. It covers the ground

No. 11 24-pt. News Gothic, 31 picas, leaded 6 pts.

The wind and the sunbeams loved

No. 12 Cheltenham Medium, 24-pt., 31 picas, leaded 6 pts.

hill glass brother take must these

No. 13 24-pt. Bodoni, 31 picas, leaded 4 pts.

friends women brother brought felt

No. 14 30-pt. Bodoni, 31 picas, leaded 2 pts.

friend throw must sat women

No. 15 24-pt. Caslon Oldstyle No, 471, 31 picas, leaded 4 pts.

joy seed kind class hold jay those

No. 16 30-pt. Caslon Oldstyle No. 471, 31 picas, leaded 2 pts.

bad sat must throw friend walk

No. 5. 30-pt. Clearface, 31 picas, leaded 6 pts.

glass bay balls far threw love
hear will had class own live
last out then dear jay clam
came goes must kind them
lost feet lake bill find think
queer brother ship sister go

24-point Clearface, leaded 6 points

brought bay class far clap than
live feet dear man boxes had boy
goes balls threw must for find out
lost kind bill go glass friend love
lake them seed will hear grow
your sister queer think then ship
jay own came brother last

24-point Clearface, leaded 6 points, 1-point letter spacing

brought clap dear boy must

balls had for came brother

30-point Cloister Oldstyle, 1-point letter spacing

grow out think lake will go

30-point Caslon Oldstyle, solid

bay out must class friend live

24-point Century School Book, leaded 6 points

last jay queer hear lake go out

24-pt. Century School Book, leaded 6 points, 1-pt. letter spacing

last brother came own jay

30-point Cloister Oldstyle, solid

lake will friend last seed lost live

No. 5. 30-pt. Clearface, 31 picas, leaded 6 pt.

than for your man brought

24-point Caslon, leaded 4 points, 2-point letter-spacing

balls had for came brother

24-point Caslon Bold, leaded 4 points, 2-point letter-spacing

lake will friend last seed

24-pt. Century School Book, leaded 10 points, 2-pt. letter-spacing

last brother came own jay

30-point Caslon Oldstyle, solid

bay out must class friend live

last jay queer hear lake go
out threw had feet far

24-point Clearface, leaded 10 points, 2-point letter-spacing

30-point Cloister Oldstyle, 1-point letter spacing

grow out think lake will go

Forty-two children in the Cleveland Classes and over seventy in classes in the cities named above were given these tests. The tests were conducted in the following manner:

> The child to be tested was taken to a quiet room during school hours.
>
> The reason for the test was explained as a desire on Mr. Irwin's part to find out which style of letters they would like to have in their reading books.
>
> The child was then given one complete set of tests and told to hold the first one where he could see it best and to read it aloud. After that he was to read the next, and so on. No time was given him to study the words. No corrections or comments were made by the Observers at any time during the testing.
>
> One person held a stop-watch and followed a duplicate copy, noting on it all hesitations, repetitions, omissions, and mistakes. The second person sat where she could measure with a ruler the distance from the child's eye to the paper. She also watched closely for signs of squinting, scowling, or other indications of an effort to see.

There were, therefore, these four factors to be measured in the determination of legibility and minimum eye fatigue and strain. Time: according to a stop-watch. Errors: actual, as recorded by the person listening to detect them and checked by a second person. Distance: as measured by a ruler while the child was reading. This distance often varied, the paper being pushed away or drawn nearer during the reading, in which cases the average distance was taken. Effort: apparent, based upon the judgment of the observer. It is recognized that such a measurement cannot be infallible, and its accuracy may be open to much criticism, especially as the observer was not in all tests the same person. Nevertheless, it seemed advisable to regard it in relation to the other measurements. To these four measurements was added a fifth, even less trustworthy than the last, but in a majority of cases very satisfactory. It is termed "Remarks", and included all verbal statements made by the child after reading

each test, and again after reading all of them and comparing them. Oftentimes, to be sure, the child's judgment did not agree with that of the record of the observer; sometimes he would say a type was "all right" when a decided effort had been made to read it; but on the other hand many of the pupils responded most intelligently and consistently, even giving logical reasons for their choice.

The results of this test for the Cleveland Classes are given below. The results from the classes in cities other than Cleveland are not included, since it was impossible to have these tests controlled by the same person. When tabulated, however, the results of the tests made in the other cities tallied very closely with the Cleveland results.

DATA COMPILED FROM LARGE TYPE READING TESTS GIVEN TO 42 CHILDREN IN THE CONSERVATION OF VISION CLASSES IN THE PUBLIC SCHOOLS OF CLEVELAND, OHIO.

Rank according to Time

Type	Average number of seconds.
24-point Century School Book	25
24 pt. Clearface	25.3
30 pt. Cloister Oldstyle	25.3
24 pt. Caslon Light	25.4
24 pt. Caslon Bold	25.7
30 pt. Caslon Oldstyle	26.3

24 pt. Century School Book	11	read	it	in	their	shortest	time,	6	in	their	longest	time
30 pt. Cloister Oldstyle	10	"	"	"	"	"	"	7	"	"	"	"
24 pt. Caslon Bold	10	"	"	"	"	"	"	7	"	"	"	"
24 pt. Clearface	10	"	"	"	"	"	"	8	"	"	"	"
24 pt. Caslon Light	9	"	"	"	"	"	"	10	"	"	"	"
24 pt. Caslon Oldstyle	2	"	"	"	"	"	"	12	"	"	"	"

Rank according to Effort

Type	
24 pt. Century School Book	6 out of 42 showed effort
30 pt. Clearface	6 " " 27 " "
24 pt. Caslon Bold	9 " " 42 " "
24 pt. Clearface	13 " " " " "
30 pt. Cloister Oldstyle	14 " " " " "
30 pt. Caslon Oldstyle	15 " " " " "
24 pt. Caslon Light	21 " " " " "

Rank according to Errors

Type	Average number of errors per type
24 pt. Caslon Bold	1.73
30 pt. Cloister Oldstyle	1.76
24 pt. Clearface	1.83
24 pt. Caslon Light	2.07
30 pt. Caslon Oldstyle	2.19
24 pt. Century School Book	2.4
30 pt. Clearface	2.5

Rank according to Distance

Type in order according to the number holding it nearest to 13 inches	Number
30 pt. Clearface	16
24 pt. Caslon Bold	13
24 pt. Clearface	10
24 pt. Century School Book	10
24 pt. Caslon Light	8
30 pt. Cloister Oldstyle	8
30 pt. Caslon Oldstyle	6

Type in order when only one type was held nearer than 13 inches.

30 pt. Clearface	13
24 pt. Caslon Bold	5
24 pt. Clearface	3
24 pt. Century School Book	1
24 pt. Caslon Light	1
30 pt. Cloister Oldstyle	1
30 pt. Caslon Oldstyle	1

Rank according to Remarks of Pupil

Type — Best and All Right.	Number
24 pt. Century School Book	34
24 pt. Caslon Bold	32
30 pt. Cloister Oldstyle	29
30 pt. Caslon Oldstyle	28
24 pt. Clearface	28
30 pt. Clearface	16
24 pt. Caslon Light	22

Note: When only one choice was made Caslon Bold was chosen 23 times; this was more than any other one type. (only 27 tested)

[illegible]

SUMMARY,

Showing the number of times a type occurs in 1st, 2nd, and 3rd place in the preceding ranking.

CLEVELAND CLASSES

1st place		2nd place		3rd place	
24 pt. Century S. Bk.	4	24 pt. Caslon Bold	3	24 pt. Clearface	4
24 pt. Caslon Bold	3	30 pt. Cloister Old.	2	30 pt. Cloister Old.	2
30 pt. Clearface	1	24 pt. Century S. Bk.	1	24 pt. Caslon Bold	1
		24 pt. Clearface	1		

WHEN THE CLEVELAND AND OUT-OF-TOWN CLASSES WERE AVERAGED TOGETHER

24 pt. Caslon Bold	2	24 pt. Caslon Bold	2	24 pt. Clearface	1
24 pt. Century S. Bk.	1	24 pt. Clearface	1	30 pt. Cloister Old.	1
24 pt. Clearface	1	24 pt. Caslon Light	1	24 pt. Caslon Old.	1
		24 pt. Century S. Bk.	1	30 pt. Clearface	1

From this data it will be seen that the element of time showed but slight variation for these types. When, however, a comparison was made of each individual child's time for the different types there was a more marked difference between the Century School Book and the Caslon Oldstyle.

In ranking for remarks, decided preference was shown for the Century School Book over the Caslon Light. Caslon Bold was chosen as the only good type more often than the Century School Book. In other words, the Century School Book was "all right" with a good many children who also found other types all right, while the Caslon Bold was "all right" when no other type was.

The ranking according to distance is not felt to be a very fair or accurate measurement. The near point for the normal eye, 13 inches, was taken as the standard. Such an arbitrary standard is not just in most cases; for, to be absolutely accurate, a point should be determined for each individual, which should represent the average distance at which he reads all the various styles of type. The distance should, therefore, be considered best when it is held nearest the average distance for the individual and not when it is held nearest the 13-inch point. The results are recorded here that errors in this factor of calculation may be avoided if any further tests should be given.

The difference in the amount of effort shown is considerable, but as this is a measurement depending upon the judgment of the observer, it will also have a high coefficient of error which has not been reckoned in the table.

The errors were the positive mistakes in letters or whole words. The fact that the Century School Book, otherwise ranking quite high, should fall so low in this, cannot be accounted for. The errors were largely in e's and o's. The order of reading the types was varied so that no one type stood in the same place in the series every time. The elements of fatigue, unfamiliarity, etc. were, therefore, evenly distributed among all the types, and could not account for these errors which seem in some way due to the shape of the letters themselves. It is possible that the amount of white in the a's and e's make them more like the o's in the Century School Book. Another consideration that is worth noting is that the Caslon Bold may have been read more easily, rapidly, and correctly because of the sub-conscious recognition of the type and letters, due to reading them for the past two years.

Considering all thes measurements: time, errors, distance, effort, and remarks, in the determination of legibility, the type having the highest rank is the Century School Book, which stands one point ahead of the Caslon Bold. In the results from the out-of-town classes the reverse is true, and in averaging the two groups of tests the Caslon Bold stands first. It occurs for the Cleveland classes, however, but once more than the Century Book in the first and second places taken together, thus showing that there is a very slight difference in the legibility of these two types.

The conclusions reached by these tests are, therefore, almost identical with the theoretical determinations and the pupils' choice of types made three years ago. The leading should undoubtedly be increased, and much emphasis should be put upon the letter-spacing. If this is sufficient and well-proportioned,

a 24-point type is preferred to a 30-point by most children. At one stage during the testing when the results did not seem to correlate very closely, it almost seemed as if no one type could be found which would be satisfactory for all the different eye conditions. In fact, one person who has made many reading tests with children having normal eye conditions believed that the use of at least three or four different styles of large type would be the only solution for adequately supplying the need for large type books, and he thought, moreover, that the tests would prove this to be true.

Accordingly, the tests were tabulated, not only under the factors given above, but also under three of the most prevalent eye conditions, in an effort to determine whether or not one type would satisfy all conditions. The records of children, having the following were thus ranked: - 1. Macula of the Cornea, which is a moderate opacity of the cornea interfering with vision. 2. Myopia, or nearsightedness which in high degrees is apt to develop and be accompanied by destructive changes in other parts of the eye. 3. Nystagmus, which is an involuntary oscillation of the eyeball and which is generally accompanied by other eye diseases, causing diminution of vision. Under these headings the various types stood almost identically the same as under the others. The Century School Book led under Macula of the Cornea, and Caslon Bold a close second. The Caslon Bold ranked first under Nystagmus and Myopia, with the Century School Book a very close second. The other types appeared, as in all other cases taken together, scattered and in the lowest ranks. The same type, in other words, which is legible for children in one group is also most legible for the majority in the other groups.

In dealing with a group, each child of which has individual peculiarities, there is grave danger in generalizing, and the deductions made from data collected from such a group cannot but contain elements of error somewhat in excess of those taken into account with normal groups. In fact, in all of the instruction in the Conservation of Vision Classes the individ-

uality of the child, both physical and mental, is an inescapable factor to be handled with the greatest thought and skill. That this factor is not considered more with the normal child is regrettable; that it must be considered with the handicapped child is imperative.

It is hoped that these tests have proved with a greater degree of certainty than ever before what types are legible, and the order of their legibility, and thatin so doing they may give satisfaction to those persons who have taken so much interest in seeing the work carried out.

Added weight and interest in the ranking of the Century School Book may be felt when it is realized that this type in smaller sizes has been considered by the American Type Founders Company as one of the best types for school books for pupils with normal sight on account of its general qualities, which include clearness, good proportions, and well-shaped letters.

It must not be overlooked that the art of printing is in itself a very important consideration in books where legibility is paramount. The method which can reduce the cost of printing without sacrificing the desired style and type must be considered. To print books in large type with type founders' type is a very expensive process. The consumption of an unusually large amount of tinted paper is alone a great addition to the cost of the Clear Type Series. To use a type which can be machine cast, and at the same time give satisfactory results to the most critical, is the only way that the classes can keep supplied with these books at reasonable prices. The Caslon Bold is a type which can be cast on the Ludlow typograph, a machine which makes a slug two and one half inches long. It does not print with the absolute perfection of a type founders' type, but with care in the making of the slugs and with the greatest attention to the inking (only the highest grade ink should be used) the Caslon Bold can be printed at rates recommendatory to Conservation of Vision Classes.

For the present the Clear Type Series will be continued in the 24-point Caslon Bold, and will be printed on the Ludlow machine in Cleveland. The leading will be increased in the new orders, and eventually a more perfect letter spacing will be employed which will give a more even distribution of white between the letters. There may still be room for the perfection of large type books for the classes, but at least certain facts have been established upon which future improvements may depend. In the printing of large type arithmetic books and large type music the same general requirements as those necessary for the reading books should be considered, i. e.

Sufficient space without too much.
Little deviation from the normal shape of the figures in the case of arithmetic, and of the notes in music.
Buff tinted paper.
Not too large a type, but a bold face.

As the material for Conservation of Vision Classes becomes increasingly available, it is certain that more and more cities will recognize the feasibility of such instruction. The future education of children with defective vision and eye conditions which become progressively worse, will not then be limited to the small number of cities now offering such opportunities, but will become a part of every city school system of the nation.

These tests were conducted under the direction of Robert B. Irwin, by Helen J. Coffin, assisted by Harriet E. Totman and others.

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Pamphlet
Binder
Gaylord Bros. Inc.
Makers
Syracuse, N. Y.
PAT. JAN 21, 1908